

Radicular cyst associated with a primary molar in the maxilla: Case report.



SADJ May 2018, Vol 73 no 4 p257 - p258

Walters J,¹ Nortjé CJ,² Shaik S.³

ABSTRACT

Radicular cysts in the primary dentition are reported to be very rare, especially in the maxilla. Asymptomatic lesions often go unnoticed, becoming very large in paediatric patients. They are regularly misdiagnosed due to the tendency for the cyst to envelop the permanent successors. The following case reports on a 10-year-old boy who presented with a very large radicular cyst in the maxilla arising from a primary molar. The lesion encompassed several permanent successors, extended to the infra-orbital rim, and expanded into the maxillary sinus, resulting in nasal septal deviation. Treatment included enucleation with histopathological confirmation of a radicular cyst. Healing was uneventful.

INTRODUCTION

Radicular cysts have been shown to be the most common jaw cyst, contributing 52.3% of the total.¹ In contrast, the lesion is considered to be very rare in the primary dentition, with a reported prevalence of only 0.5%-3.3% of all radicular cysts.²⁻⁴ The lesion is classified as an inflammatory cyst of odontogenic origin.⁵ The development of a radicular cyst in primary teeth is identical and histologically indistinguishable from the process affecting permanent teeth.³ The lesion originates from inflammatory activation of epithelial root sheath residues, otherwise known as the cell rests of Malassez.^{2,4,5} Chronic low-grade inflammatory irritation in the periapical area of a tooth with a necrotic pulp and a pre-existing apical granuloma can result in a cystic lesion.⁵ The high prevalence rate for caries in primary molars is considered to be the most common cause of the infection and these are also the teeth most likely to be affected.^{3,6,7} These lesions are often asymptomatic and rapidly increase in size becoming very large in children who have less dense bone compared with adults.^{4,6-8} Large lesions often envelope the permanent successors resulting in misdiagnoses.⁹⁻¹¹

CASE REPORT

A 10-year-old boy was referred to the Department of Maxillofacial and Oral Surgery, Faculty of Dentistry, University of the Western Cape, Tygerberg Hospital in July 2017. At the initial visit he presented with a slow growing expansile lesion on the right side of the face in

KEYWORDS

Radicular cyst, primary dentition, molar, maxilla, pantomography, computed tomography, enucleation.

the infra-orbital area. Intra oral examination revealed carious teeth in all four quadrants. The swelling appeared to originate in the right maxillary canine region. The patient was otherwise healthy with no medical history or known allergies. A pantomograph (Figureure. 1, A) was performed revealing a large ill-defined, homogenous, radiolucent lesion in the right maxilla, causing tooth divergence, impaction, follicle displacement, envelopment of permanent successors, extension to the maxillary sinus. Several carious lesions were evident. Computed Tomography (CT) axial slices (Figure. 1, B) showed a large, thin walled, circumscribed cystic lesion of intermediate density in the right maxilla, containing a tooth and causing significant expansion of the buccal cortex. The maximum dimension measured 40mm x 30mm on axial slices. Figure. 1, C shows the medial wall of the lesion expanding towards the nasal cavity causing deviation of the nasal septum to the left. The left maxillary sinus and some left ethmoidal cells showed intermediate density filling, indicative of mucosal secretions. The radiographic diagnostic report provided a differential diagnosis consisting of a Dentigerous cyst, Radicular cyst, Ameloblastoma and Odontogenic Keratocyst. Surgical treatment was performed under general anaesthesia. A crevicular and releasing incision was made to reveal a thin egg shell-like cortex. Removal of the cortex facilitated enucleation with inclusion of the impacted permanent successors. The specimen measured 40mm x 30mm x 20mm. Copious irrigation was performed and closure achieved with 3/0 Vicryl®. Unrestorable and retained primary teeth were extracted. Patient follow-up and healing were uneventful. Macroscopic histopathological examination revealed a cystic lesion containing teeth. Microscopic sections showed an inflamed cyst wall lined by variable hyperplastic layers of epithelium with odontogenic origin. Diagnosis of a radicular cyst was confirmed.

DISCUSSION

Radicular cysts involving the primary dentition are most often associated with mandibular molars and endodontically treated teeth compared with the maxilla.^{3,10,12} There is a slight male predilection and the cysts most commonly occur between ages of 3 to 19 years.^{2,11} In a survey of 1300 recorded radicular cysts over a 25 year period, only seven was documented to originate from a primary tooth. An extensive review, published in 1985, of literature dating from 1898 only 28 similar cases were found.¹³

1. **Jaco Walters.** *BChD, PDD (OS), PGD (MFR)**
2. **Christoffel J. Nortjé.** *BChD, PhD, DSc, ABOMR**
3. **Shoayeb Shaik.** *BChD, PDD, MSc (MFR)**

*Department of Diagnostics and Radiology, Faculty of Dentistry, University of the Western Cape, Cape Town, South Africa.



Figure 1. A, Panoramiograph shows an ill-defined, homogenous, radiolucent lesion in the right maxilla, causing tooth divergence, impaction, follicle displacement, envelopment of permanent successors, extension to the maxillary sinus (red arrows) together with several carious lesions. B, CT axial bone window presents a large, thin walled, circumscribed cystic lesion of intermediate density in the right maxilla containing a tooth and causing expansion of the buccal cortex (yellow arrow). C, CT axial soft tissue window. Observe the medial wall of the lesion expanding towards the nasal cavity, causing deviation of the nasal septum to the left (green arrow).

The reason why the radicular cyst is considered rare is unclear but may be due to misdiagnoses, or may be undiagnosed, under reported, resolution of lesion due to exfoliation, endodontic treatment or extraction without histological analysis.^{2,6,14,15} Primary teeth pulpal lesions are more likely to spread to the inter-radicular area rather than apically.¹⁶ The lifespan of a primary tooth is short and drainage of apical infections occurs much more readily due to the lower resistance of surrounding structures.^{7,17} It has been reported that endodontically treated teeth have a high prevalence for developing a radicular cyst.⁷ This may be due to the nature of therapeutic agents used during primary tooth pulp therapy and it is recommended that endodontically treated primaries be observed until exfoliation.^{7,12,15,18} Lesions are often misdiagnosed as a periapical granuloma when radiographically an apical radiolucency is observed or as a dentigerous cyst when a succeeding permanent tooth is encompassed in the lesion.⁹⁻¹¹ Displacement of permanent tooth buds can be significant, such as to the floor of the orbit in the maxilla and to the inferior border in the mandible. Lesion growth can be 4-5mm annually.^{8,14} Histopathological features include the presence of non-keratinized stratified squamous epithelium which may demonstrate hyperplasia, exocytosis or spongiosis. The wall consists of dense fibrous connective tissue with inflammatory infiltrate. Inflammatory cells infiltrate the epithelial lining as well the fibrous connective tissue. The cystic lumen may be filled with fluid and cellular debris. Other features such as clusters of giant cells, foreign endodontic material, Rushton's hyaline bodies in the lining and foam cells may be observed occasionally.^{1,5,19} Multidisciplinary co-operation between the treating clinician, radiologist and pathologist is imperative. Considering all features and findings has been suggested to facilitate reaching the correct diagnosis.^{9,15} Clinical features may include mandibular buccal cortical expansion, presence of a non-vital tooth, and an asymptomatic lesion associated with a primary tooth. Radiographically a well-defined unilocular radiolucency may be seen, associated with a primary tooth, and with displacement but no involvement of permanent successors. Surgically no association with permanent successors will be found and histological confirmation of a cystic epithelial lining may suggest radicular cyst of the primary dentition.^{7,10,11,15} Treatment of these lesions varies between operators and is dictated by the

size of the lesion. Essentially management consists of removal of the offending tooth with either enucleation, marsupialization or in combination.^{2,20} Complete removal of the cystic lesion with its lining via enucleation is considered the treatment of choice, as marsupialization has disadvantages such as multiple visits and the leaving the remainder of pathological tissue in situ. Marsupialization may be beneficial in the primary dentition to decompress the cystic lesion and preserve the underlying successors, possibly resulting in eventual eruption.²¹ Intermediate removable appliances may be constructed to facilitate function and to prevent debris entering the cavity. Some cases show rapid healing and eruption of underlying permanent successors without the necessity of a removable appliance.⁴

CONCLUSION

The rarity, size, location and extensions of the present case makes it notable. Early diagnosis is imperative when a radicular cyst is suspected in a paediatric patient. These lesions can rapidly become large, affecting surrounding structures. A multidisciplinary approach to achieve the correct diagnosis and successful treatment is recommended.

References

- Martin L, Speight PM. Odontogenic cysts. *Diagnostic Histopathology*. 2015;21(9):359-69.
- Uloopi KS, Raju US, Vinay CP, Shruttha SP, Chandrasekhar R. Conservative management of large radicular cysts associated with non-vital primary teeth: A case series and literature review. *Journal of Indian Society of Pedodontics and Preventive Dentistry*. 2015;33(1):53-6.
- Mass E, Kaplan I, Hirshberg A. A clinical and histopathological study of radicular cysts associated with primary molars. *Journal of Oral Pathology & Medicine*. 1995;24(10):458-61.
- Sakurai A, Taniguchi Y, Hayashibara T, et al. Two cases of less invasive treatment for radicular cyst in primary dentition. *Pediatric Dental Journal*. 2011;21(1):78-84.
- Neville BW, Allen CM, Damm DD, Chi AC. *Oral and Maxillofacial Pathology*. 4th ed. St. Louis, Missouri: Elsevier; 2016.
- Narsapur S, Chinnanavar S, Choudhari S. Radicular cyst associated with deciduous molar: A report of a case with an unusual radiographic presentation. *Indian Journal of Dental Research*. 2012;23(4):550-3.
- Ramakrishna Y, Verma D. Radicular cyst associated with a deciduous molar: A case report with unusual clinical presentation. *Journal of the Indian Society of Pedodontics and Preventive Dentistry*. 2006;24(3):158-61.
- Sun K, Chen MY, Chiang H, Tsai H. Treatment of large jaw bone cysts in children. *Journal of Dentistry for Children*. 2009;76(3):217-23.
- Wood RE, Nortje CJ, Padayachee A, Grotepass F. Radicular cysts of primary teeth mimicking premolar dentigerous cysts: report of three cases. *ASDC Journal of Dentistry for Children*. 1988;55(4):288-90.
- Takiguchi M, Fujiwara T, Sobue S, Ooshima T. Radicular cyst associated with deciduous molar following pulp therapy: A case report. *International Journal of Paediatric Dentistry*. 2001;11(6):452-5.
- Lustmann J, Shear M. Radicular cysts arising from deciduous teeth: Review of the literature and report of 23 cases. *International Journal of Oral Surgery*. 1985;14(2):153-61.
- Savage NW, Adkins KF, Weir A V., Grundy GE. An histological study of cystic lesions following pulp therapy in deciduous molars. *Journal of Oral Pathology & Medicine*. 1986;15(4):209-12.
- Shear M, Speight PM. *Cysts of the Oral and Maxillofacial Regions*. 4th ed. Oxford: Blackwell Munksgaard; 2007.
- Neelkant MW, Saleem M, Sulabha AN, Sameer C. Radicular cyst associated with endodontically treated deciduous molar: A case report. *Indian Journal of Stomatology*. 2012;3(2):146-8.
- Gandhi S, Franklin DL. Case report: Presentation of a radicular cyst associated with a primary molar. *European Archives of Paediatric Dentistry*. 2008;9(1):56-60.
- De Castro LA, Campos Maia SR. Maxillary osteolytic lesion in a 10-year-old girl: A dentigerous or radicular cyst? A case report and discussion. *Revista Portuguesa de Estomatologia, Medicina Dentaria e Cirurgia Maxilofacial*. 2012;53(1):24-28.
- Nagata T, Nomura J, Matsumura Y, et al. Radicular cyst in a deciduous tooth: a case report and literature review. *Journal of Dentistry for Children*. 2008;75(1):80-84.
- Nagarathna C, Jaya AR, Jaiganesh I. Radicular cyst followed by incomplete pulp therapy in primary molar: A case report. *Journal of Indian Society of Pedodontics and Preventive Dentistry*. 2013;31(3):191-3.
- Cawson RA, Odell EW. *Cawson's Essentials of Oral Pathology and Oral Medicine*. 8th ed. Churchill Livingstone; 2008.
- Dhote VS, Thosar NR, Baliga SM, Dharnadhikari P, Bhatiya P, Fulzele P. Case report : Surgical management of large radicular cyst associated with mandibular deciduous molar using platelet-rich fibrin augmentation: a rare case report. *Contemporary Clinical Dentistry*. 2017;8(4):538-44.
- Allon DM, Allon I, Anavi Y, Kaplan I, Chaushu G. Decompression as a treatment of odontogenic cystic lesions in children. *Journal of Oral and Maxillofacial Surgery*. 2015;73(4):649-54.